REMARKS

Claims 19-28, 30-39, and 41-42 are pending and stand rejected. Claims 19, 21-22, 30, 32-33, and 41-42 are hereby amended.

Rejection based on Heisele and Viola

Claims 19-20, 22-28, 30-31, and 33-39, and 41-42 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Heisele ("Face Recognition with Support Vector Machines") in view of Viola ("Robust Real-time Object Detection"). Applicant traverses. Additionally, for the record, Applicant traverses Examiner' s assertions regarding the motivation to combine Heisele and Viola.

On August 6, 2009, Examiner and the undersigned attorney discussed claim 19 (as previously pending) and Heisele. Specifically, they discussed the following claim limitation (emphasis added):

> determining, from the first set of body part classifications, a first body part classification that maximizes a probability that a person class of the facial components in the first set of facial components that are associated with the first body part classification is the first person.

No agreement was reached.

Claim 19 is hereby amended to clarify the above claim limitation. As amended, claim 19 recites (emphasis added):

> for each body part classification in the first set of body part classifications:
> determining, from the first set of facial components, a subset of facial components that are associated with the body part classification; and
> determining a probability that a person class of the subset of facial components is the first person; and
> determining a first body part classification in the first set of body part classifications that maximizes the probability.

Claim 19 recites, in part, "determining a probability that a person class of the subset of facial components is the first person." This portion of claim 19 concerns the person class of multiple facial components, specifically, "a subset of facial components [from the first set of facial components] that are associated with the body part classification." These facial components have the same body part classification (e.g., "nose") and are from the same person at different viewpoints.

A probability is calculated that the person class of these facial components is a particular person. For example, a classifier receives as input three "noses" that are from the same person at different viewpoints. The classifier then determines the probability that the three noses belong to a particular person.

The hypothetical combination of Heisele and Viola does not disclose, teach, or suggest the claimed element "determining a probability that a person class of the subset of facial components is the first person."

Heisele – Heisele discusses two global approaches and one component-based approach to face recognition and evaluates their robustness against pose changes (abstract). The component system detects and extracts local components of a face (abstract). The training set for the component system included images of seven heads that were rotated between -30° and +30° in depth (sections 4.2, 4.1, 3.1). Components were extracted from each image in the training set (section 4.2). Assume, *arguendo*, that the components extracted from images of one of the seven heads in Heisele corresponds to the claimed element "a first set of facial components extracted from facial identification training image data of a face of a first person at a first set of viewpoints."

As explained above, the phrase "subset of facial components" refers to facial components that have the same body part classification and are from the same person at different viewpoints. Assume, *arguendo*, that Heisele's extracted components can be grouped according to their body part classifications and that one of these groups would correspond to the claimed element "subset of facial components." Heisele still does not disclose, teach, or suggest determining a probability that a person class of facial components grouped in this way is a particular person.

It follows that Heisele does not disclose, teach, or suggest the claimed element "determining a probability that a person class of the subset of facial components is the first person."

Viola – Viola does not remedy this deficiency. Viola discusses a framework for object detection that is demonstrated on the task of face detection (section 1, paragraph 1). Viola's detection system does not work directly with image intensities (§1, ¶3). Instead, images are classified based on the value of "simple features" (§2, ¶1). A very small number of features can be combined to form an effective classifier (§3, ¶2). A variant of the AdaBoost algorithm is used to select the features and train the classifier (§3, ¶3). Specifically, the algorithm selects the single feature that best separates the positive and negative examples (§3, ¶6).

As explained above, the phrase "subset of facial components" refers to facial components that have the same body part classification and are from the same person at different viewpoints. Assume, *arguendo*, that Viola's features can be grouped according to their body part classifications and that one of these groups would correspond to the claimed element "subset of facial components." Viola still does not disclose, teach, or suggest determining a probability that a person class of features grouped in this way is a particular person.

It follows that Viola does not disclose, teach, or suggest the claimed element "determining a probability that a person class of the subset of facial components is the first person."

Since the hypothetical combination of Heisele and Viola does not disclose, teach, or suggest the claimed element "determining a probability that a person class of the subset of facial components is the first person," it follows that the hypothetical combination of Heisele and Viola also does not disclose, teach, or suggest the claimed element "determining a first body part classification in the first set of body part classifications that maximizes the probability."

Therefore, claim 19 is patentable over the hypothetical combination of Heisele and Viola.

Independent claim 30 recites similar language and is also patentable over the hypothetical combination of Heisele and Viola for at least the same reasons.

Rejection based on Heisele, Viola (I), and Viola (II)

Claims 21 and 32 were rejected under 35 USC 103(a) as being unpatentable over Heisele ("Face Recognition with Support Vector Machines") in view of Viola (I) ("Robust Real-time Object Detection") and Viola (II) ("Complex Feature Recognition"). Applicant traverses. Additionally, for the record, Applicant traverses Examiner' s assertions regarding the motivation to combine Heisele, Viola (I), and Viola (II).

Viola (II) does not remedy the deficiencies of Heisele and Viola (I). Viola (II) discusses complex feature recognition (CFR), which discovers features that are effective for classifying an object across a wide variety of poses (page 7, second paragraph). The training set included 15 images for each of 10 people, where each of the 15 images had a different pose (p. 17). Each image was divided into 20 features (p. 17, last paragraph). Assume, *arguendo*, that the features

from images of one of the 10 people in Viola (II) correspond to the claimed element "a first set of facial components extracted from facial identification training image data of a face of a first person at a first set of viewpoints."

Assume, *arguendo*, that Viola (II)'s features can be grouped according to their body part classifications and that one of these groups would correspond to the claimed element "subset of facial components." Viola (II) does not disclose, teach, or suggest a probability that a person class of the features in a particular group is the first person, let alone determining a body part classification that maximizes this probability.

It follows that Viola (II) does not disclose, teach, or suggest the claimed elements "determining a probability that a person class of the subset of facial components is the first person" and "determining a first body part classification in the first set of body part classifications that maximizes the probability."

Therefore, claims 21 and 32 are patentable over the hypothetical combination of Heisele, Viola (I), and Viola (II).

The claims not specifically mentioned above depend from their respective base claims, which were shown to be patentable over the hypothetical combination of Heisele and Viola. In addition, these claims recite other features not included in their respective base claims. Thus, these claims are patentable for at least the reasons discussed above, as well as for the elements that they individually recite.

Examiner is invited to contact the undersigned in order to advance the prosecution of this case.

Respectfully submitted,
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